Highlights

Overview

This issue of the *Natural Gas Monthly* contains estimates of natural gas data through April 2000 for many data series at the national level. Estimates of natural gas prices are available through January 2000 for most series. A recap of the 1999-2000 heating season is also provided, discussing the effect that temperatures had on natural gas demand and prices. Highlights of the data estimates contained in this issue are:

The cumulative daily rate of production for the first 4 months of 2000 is estimated to be 52.0 billion cubic feet per day, only slightly above the comparable 1999 rate of 51.8 billion cubic feet per day. Net imports showed a 2-percent increase over 1999 as they reached 9.3 billion cubic feet per day during this same period.

After the warmest winter in recorded history, working gas in underground storage at the end of April 2000 is estimated to be 1,150 billion cubic feet, the lowest level of working gas for the first month of the storage refill season since the end of April 1993.

During January through April 2000, average daily end-use consumption of natural gas is estimated to be 70.6 billion cubic feet per day, 1 percent below the daily rate for the same period in 1999. Declines in the residential and commercial sectors were offset by increases in the industrial sector.

Estimates of the price paid for natural gas in the electric utility sector are now available through December 1999. The average price paid for the year was $2.56 per thousand cubic feet, 7 percent higher than in 1998.

Supply

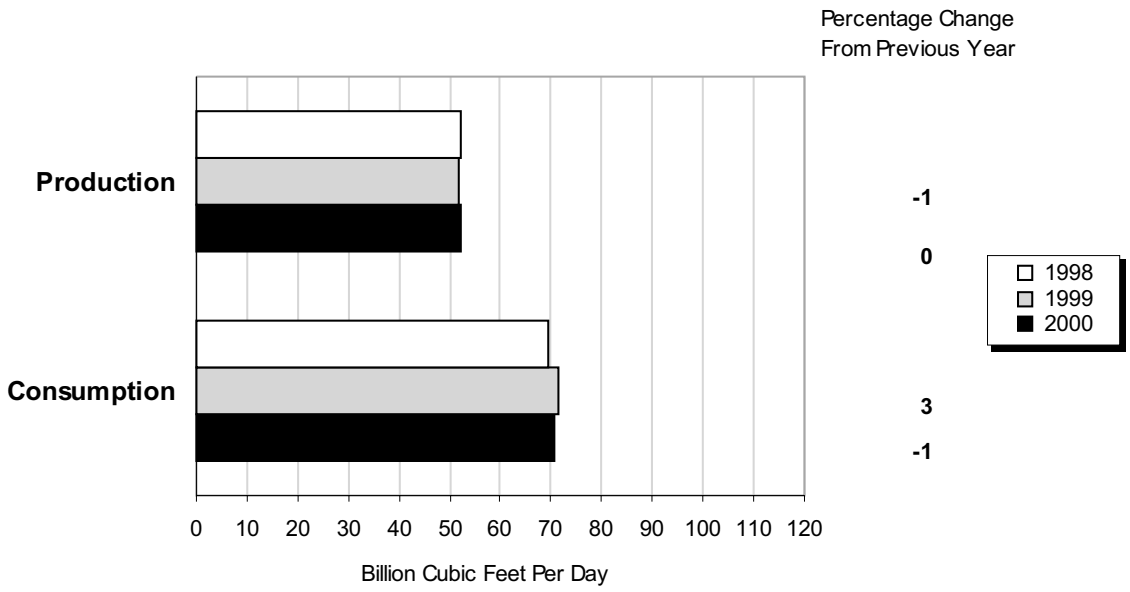
Cumulatively for January through April 2000, both dry production and net imports of natural gas are close to the levels seen in 1999. Cumulative dry production is estimated to be 6,291 billion cubic feet or 52.0 billion cubic feet per day, compared with 51.8 billion cubic feet per day in 1999 (Table 1). Cumulative net imports are estimated to be 1,128 billion cubic feet or 9.3 billion cubic feet per day, 2 percent more than the 9.2 billion cubic feet per day seen in 1999 (Table 2).

Estimated dry production in April 2000 is 1,551 billion cubic feet or 51.7 billion cubic feet per day. This is just below the rate of 52.0 billion cubic feet per day in March 2000. In March 1999, daily production was also 52.0 billion cubic feet per day, but there was a larger drop to the April 1999 level of 51.0 billion cubic feet per day.

Net imports of natural gas continue to grow compared with levels of the previous 2 years. Net imports in April 2000 are estimated to be 277 billion cubic feet, 4 percent higher than in April 1999 and 15 percent higher than in April 1998. The daily rate of net imports in April 2000 is 9.2 billion cubic feet per day, compared with 9.4 billion cubic feet per day seen in March 2000.

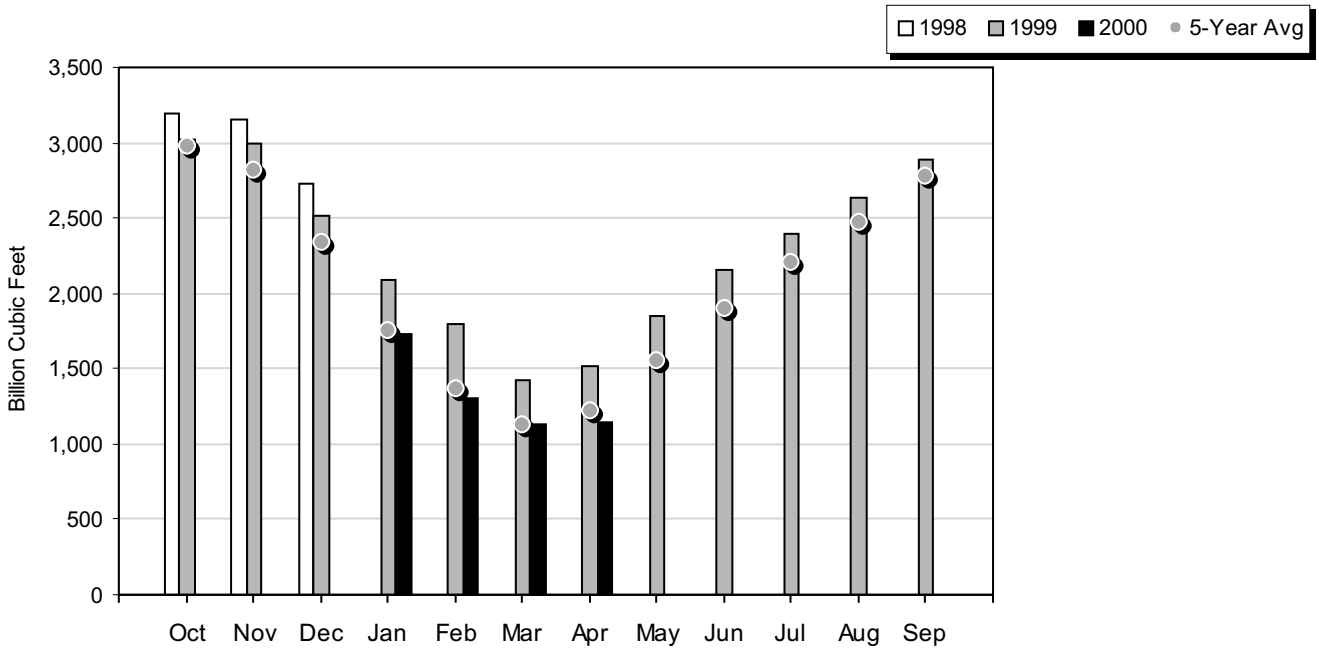
After the warmest winter in recorded history, working gas in underground storage at the end of April 2000 is estimated to be 1,150 billion cubic feet (Table 10). Storage levels during April, the first month of the storage refill season, have varied greatly during the past several years. The amount of working gas in storage at the end of April 2000 was 24 percent less than in April 1999 and 17 percent less than in April 1998; however, it was 9 percent higher than in April 1997 and 35 percent higher than the 854 billion cubic feet of working gas at the end of April 1996. Net injections of natural gas into storage are estimated to be 25 billion cubic feet during April 2000, 66 billion cubic feet less than in April 1999. Further information about natural gas storage during the 1999-2000 heating season is discussed in the section, “Recap of the 1999-2000 Heating Season.”

Figure HI1. Average Daily Rate of Natural Gas Production and Consumption, January-April, 1998-2000



Source: Table 2.

Figure HI2. Working Gas in Underground Storage in the United States, 1998-2000



Note: The 5-year average is calculated using the latest available monthly data. For example, the December average is calculated from December storage levels for 1995 to 1999 while the January average is calculated from January levels for 1996 to 2000. Data are reported as of the end of the month, thus October data represent the beginning of the heating season.

Source: Form EIA-191, "Underground Natural Gas Storage Report," Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," and Short-Term Integrated Forecasting System.

End-Use Consumption

Cumulatively for January through April 2000, end-use consumption of natural gas is estimated to be 8,539 billion cubic feet or 70.6 billion cubic feet per day, only 1 percent below the daily rate for the first 4 months of 1999 (Table 3). Consumption fell in the residential and commercial sectors, but increased in the industrial sector.

The residential and commercial sectors are highly responsive to weather-related space-heating requirements. Cumulative residential consumption during January through April 2000 is estimated to be 2,572 billion cubic feet or 21.3 billion cubic feet per day, 4 percent lower than the daily rate for the same period in 1999. Although some areas of the country experienced periods of cold temperatures during January and February, overall the first 3 months of the year were warmer than normal and warmer than the first quarter of 1999 (Table 26). Residential consumption in April 2000 is estimated to be 398 billion cubic feet, 5 percent less than a year ago. Consumption also declined in the commercial sector, although by a much smaller amount. Cumulative commercial consumption from January through April is estimated to be 12.5 billion cubic feet per day, 1 percent lower than the comparable 1999 daily rate of 12.7 billion cubic feet.

The daily rate of natural gas industrial consumption was 25.1 billion cubic feet for January through April 2000 compared with 24.3 billion cubic feet per day during the first 4 months of 1999, an increase of 3 percent. Data for the electric utility sector are available only through January 2000. Consumption in this sector rose in January to 190 billion cubic feet, 9 percent more than the previous month and 6 percent above the January 1999 level. This increase occurred despite an increase in the natural gas wellhead price, which rose by 4 percent from December 1999 to reach $2.12 per thousand cubic feet in January 2000.

Prices

The monthly average wellhead price for natural gas generally rose during 1999, peaking at $2.44 per thousand cubic feet in November (Table 4). The wellhead price has been significantly lower since then, averaging an estimated $2.03 per thousand cubic feet in December 1999 and $2.12 per thousand cubic feet in January 2000. However, the price in January 2000 is 18 percent higher than that of January 1999 (Figure HI4).

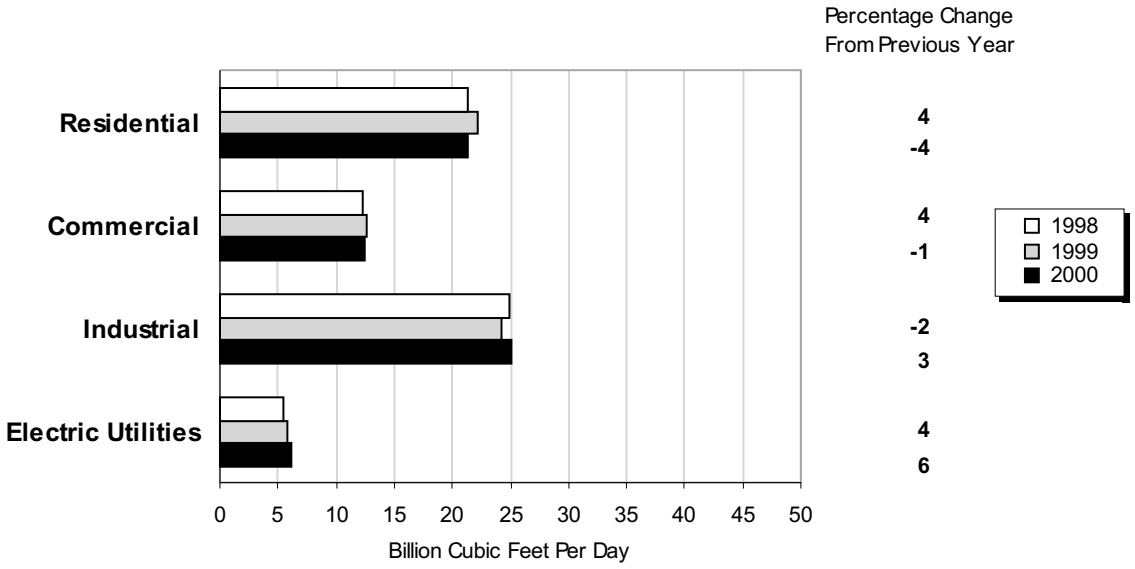
Estimates of average residential prices for natural gas have declined steadily from a high of $8.88 per thousand cubic feet in August 1999 to $6.17 per thousand cubic feet in January 2000. In the residential sector, fixed costs account for a large proportion of the average price paid for natural gas. As space-heating needs increase during the winter, the fixed costs are spread out over a larger volume of consumed gas, and the *average cost per unit of gas* declines. Although prices have been lower in recent months, higher residential consumption during these winter months results in higher total expenditures for natural gas compared with the summer. For example, consumption of 878 billion cubic feet in January 2000 resulted in total expenditures in January 2000 of $5.4 billion, compared with $1.0 billion in August 1999 when only 117 billion cubic feet of gas was consumed.

The average price paid for natural gas by residential users in January 2000 was 3 percent higher than in January 1999. In the commercial sector, the estimated price[1] paid for natural gas in January 2000 was $5.06 per thousand cubic feet, just $0.02 below that of January 1999. The estimated price paid by industrial users in January 2000 was $2.99 per thousand cubic feet, 3 percent lower than in January 1999.

Estimates of the price paid for natural gas in the electric utility sector are now available through December 1999. The December price was $2.63 per thousand cubic feet, 13 percent lower than in November 1999, but 18 percent higher than in December 1998. Prices during 1999 were higher than in 1998 in every month beginning in June. The difference ranged from 27 to 33 percent from August through November. The average price paid for the year 1999 was $2.56 per thousand cubic feet, 7 percent higher than in 1998.

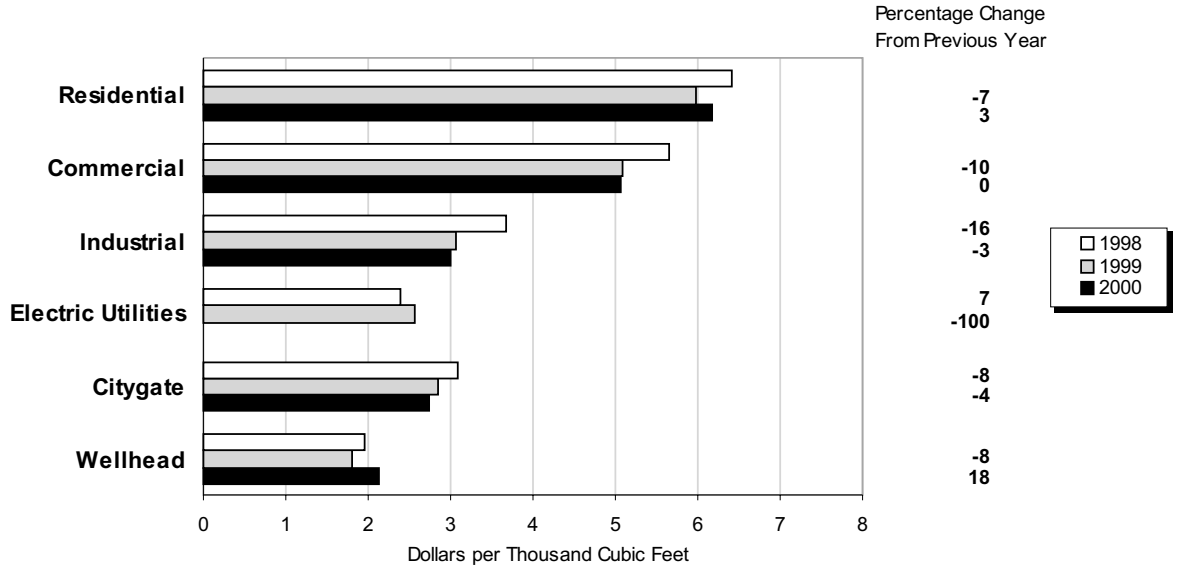
1 End-use prices in the residential, commercial, and industrial sectors are for onsystem gas sales only. While monthly onsystem sales are nearly 100 percent of residential deliveries, in 1999 they were 65 percent of commercial deliveries and only 17 percent of industrial deliveries (Table 4).

Figure HI3. Average Daily Rate of Natural Gas Deliveries to Consumers, January-April, 1998-2000



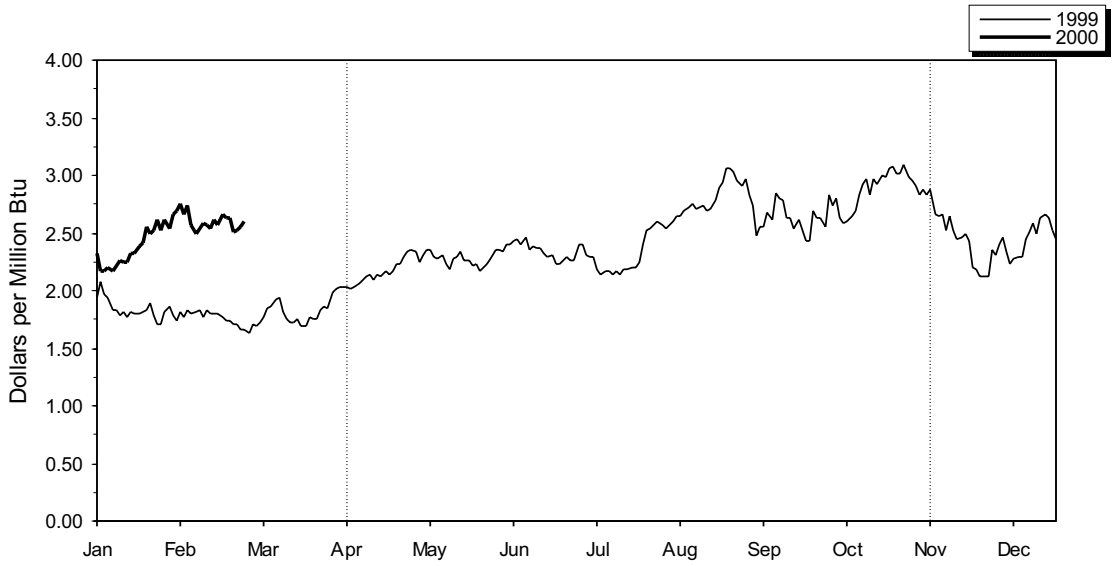
Note: Electric utilities reflect deliveries for January only.
Source: Table 3.

Figure HI4. Average Delivered and Wellhead Natural Gas Prices, January, 1998-2000



Note: Commercial and industrial average prices reflect onsystem sales only. The reporting of electric utility prices is 1 month behind the reporting of other prices.
Source: Table 4.

Figure HI5. Daily Futures Settlement Prices at the Henry Hub



Note: The futures price is for the near-month contract, that is, for the next contract to terminate trading. Contracts are traded on the New York Mercantile Exchange. April 1 is the beginning of the natural gas storage refill season. November 1 is the beginning of the heating season.
Source: Commodity Futures Trading Commission, Division of Economic Analysis.

More recent data on natural gas prices at the Henry Hub show that both daily futures settlement prices and daily average spot price generally have increased since early January 2000. Both the near-month futures and spot prices have been above $3.00 per million Btu since the second week of April 2000.[2] Somewhat cooler-than-normal temperatures in the Midwest and Northeast during April 2000 led to net storage withdrawals of 4 billion cubic feet during the first 3 weeks of the month according to the American Gas Association[3]—an unusual situation for April, which is classified as the first month of the storage refill season. The futures contract for May delivery closed on April 26, 2000, settling at $3.089 per million Btu, $0.741 (32 percent) higher than the closing price of the May 1999 contract (Figure HI5). As with the expiration of the April 2000 contract, this was the highest price for this calendar month since the futures market opened in 1991.

Recap of the 1999-2000 Heating Season

Prices rise despite record warm temperatures

The past winter was highlighted by record warmer-than-normal temperatures contrasted with strong demand for natural gas and sharp increases in petroleum product prices that contributed to generally increasing prices for natural gas. According to the National Weather Service (NWS), the heating season (November to March) had 14 percent lower-than-normal heating degree days (HDD) in the lower 48 states. The overall warmer-than-normal winter weather was punctuated by a period of very cold temperatures in the some parts of the Midwest and much of the Northeast. The period of low temperatures in the Northeast strained markets in that region and saw prices rise sharply for more than 2 weeks in January and

2 The near-month futures settlement price was $3.021 per million Btu on April 12, 2000 and the average spot price was $3.05 per million But on April 13, 2000.

3 Energy Information Administration, *Natural Gas Weekly Market Update*. http://www.eia.doe.gov (May 1, 2000).

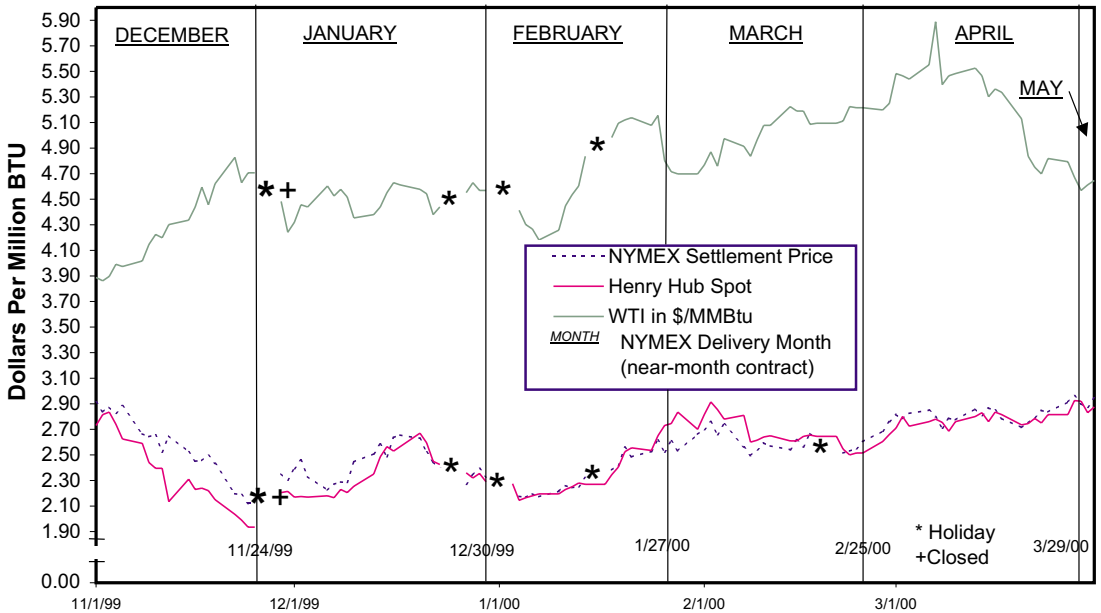
early February. Even with the overall generally mild temperatures for much of the winter, demand for natural gas remained strong throughout the season as the continued expansion in the United States economy utilized a growing amount of energy resources. Compared with the previous winter, consumption in both the commercial and industrial sectors grew by about 2 percent while in the residential sector the lowered space-heating demand reduced consumption nationally by 3 percent (Table 3). Also during this period, net imports increased 7 percent compared to the same time last year and reached a record monthly high of 305 billion cubic feet (Bcf) in January (Table 2).

Mild temperatures in November 1999 got the heating season off to an unseasonably warm start, resulting in HDD's that were more than 19 percent below normal for the month (Table 26). However, as has been the case in 3 of the last 4 years, some of the highest wellhead prices of the year prevailed during the fall primarily because of concerns about domestic gas supplies. In October and November average natural gas prices at the wellhead were $2.31 and $2.44 per thousand cubic feet (Mcf) (Table 4). Prices did move down in December to $2.03 per Mcf then rose to $2.12 per Mcf in January. Based on futures contract closing prices for February and March, this decline was short-lived as prices on the NYMEX for those months were $2.61 and $2.60 per million Btu (MMBtu), respectively. Also during this period, the impact of OPEC's April 1999 agreement on reductions in production quotas began to affect world oil prices significantly. In the United States, the price of West Texas Intermediate (WTI) crude oil moved up steadily to more than double the price from last year, and in January and February was trading above $28.00 per barrel most days or over $4.80 per MMBtu. Prices at most major natural gas spot market locations during the first quarter of 2000 were reported in industry publications to have also moved up steadily during this time. At the Henry Hub in Louisiana, prices ranged between $2.25 and $2.90 per MMBtu during this period. In addition, in contrast to the previous 3 winters beginning in 1997, prices remained relatively high in the last 2 months of the heating season and have continued to move up in April. This is another indiction of the continued strong demand for natural gas. (The spot market and NYMEX futures prices along with the WTI are tracked daily and reported weekly in the Energy Information Administration's (EIA) *Natural Gas Weekly Market Update* (NGW) in the following graph.)

Warmest winter in 105 years still had some cold regional weather

The National Oceanic and Atmospheric Administration (NOAA) reported in early April that this past

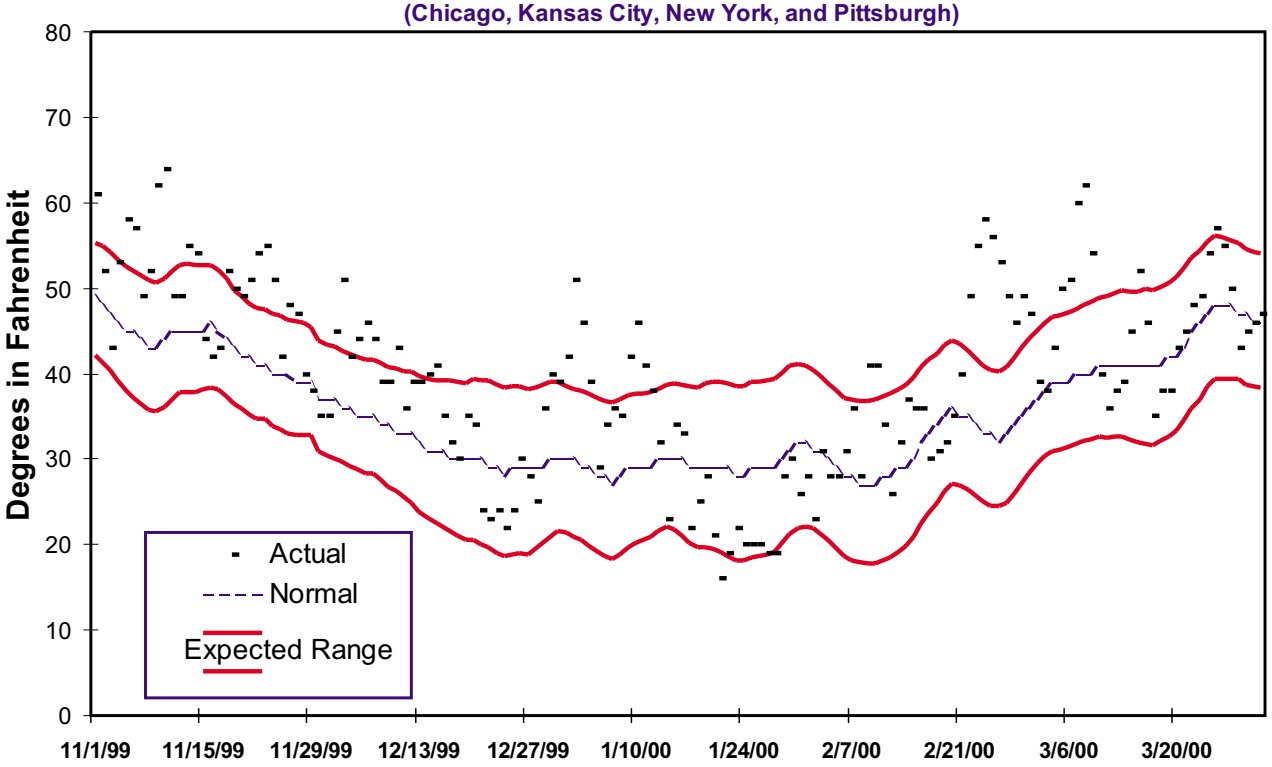
NYMEX Futures, Henry Hub Spot, and WTI* Spot Prices



Note: The Henry Hub spot price is from the GAS DAILY and is the midpoint of their high and low price for a day. The WTI price, in dollars per barrel, is the "sell price" from the GAS DAILY, and is converted to $/MMBtu using a conversion factor of 5.80 MMBtu per barrel. The dates marked by vertical lines are the NYMEX near-month contract settlement dates. * WTI - West Texas Intermediate daily crude oil price.

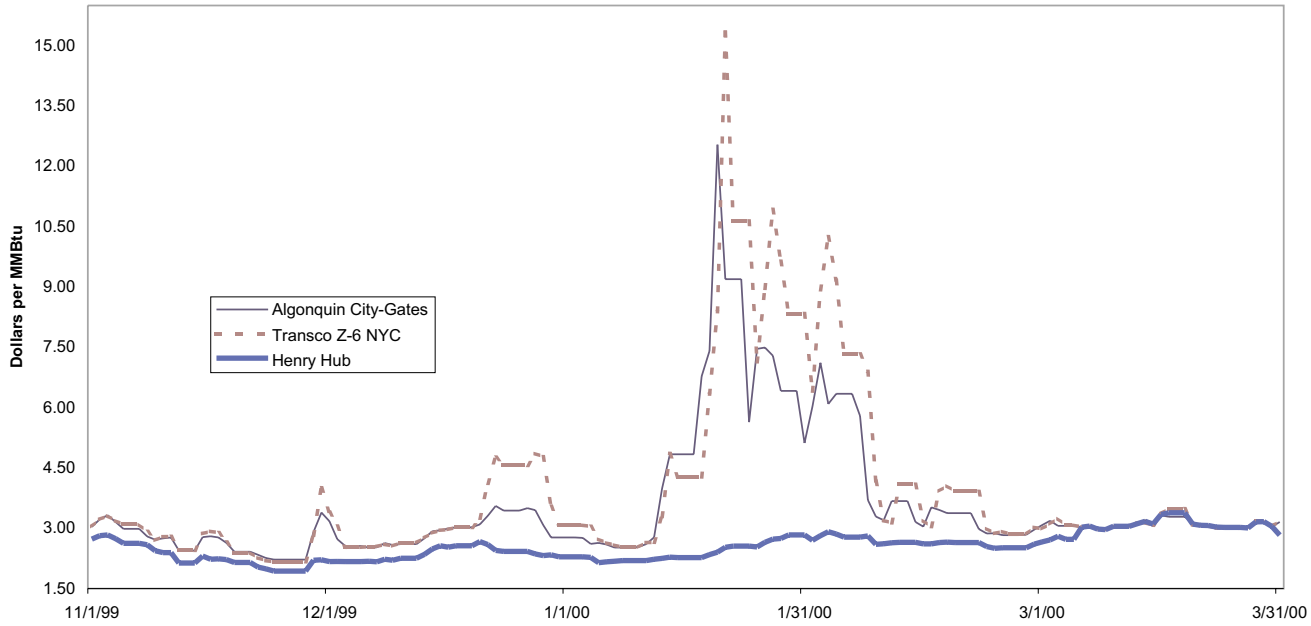
Average Temperature for Four Major Gas Consuming Metro Areas

(Chicago, Kansas City, New York, and Pittsburgh)



The bounds are computed by adding and subtracting from the average temperatures for the last 10 years an amount equal to twice an estimate of the standard deviation for temperatures on a day.

Regional Spot Market Prices Winter 1999-2000



Source: Midpoint of prices in the GAS DAILY (November '99 - March '00).

winter, which had a national average temperature of over 47 degrees Fahrenheit, was the warmest since the government began keeping records 105 years ago. For the second winter in a row, temperatures in the lower 48 states were again dominated by a large "La Nina" weather pattern in the Pacific Ocean. According to National Weather Service data, the generally mild temperatures nationally resulted in HDD's that were 6 percent lower than last winter and 14 percent below normal.

However, from mid-January to early February, the Northeast did have a period of severe weather in which daytime highs between 10 and 20 degrees lingered for over a week in many areas and resulted in increased demand for space-heating fuels. In some Northeast states residential natural gas consumption in January increased by 5 percent compared to the previous January. The composite average temperatures in four major gas-consuming metropolitan areas monitored by EIA's NGW were below average for most days during a 3-week period. This contrasts sharply with the relatively balmy weather in most of November and December, early January, and much of February and March.

Some regional spot market prices rose sharply

Prices at markets and city-gates located in the Northeast moved up sharply in response to the period of low temperatures and increased demand in January and February. Several pipeline companies also issued operational flow orders at locations serving the Northeast that contributed to raising spot market prices in the region. Spot prices at markets that serve the large Northeast urban areas exceeded $10.00 per MMBtu in late January. In the Midwest, where the low temperatures did not last as long, prices at the Chicago spot markets also moved up during this period but peaked at a much lower level of about $2.90 per MMBtu. A key factor in why prices at Chicago city-gate markets remained below $3.00 per MMBtu in January and February is the Midwest's significantly larger pipeline transportation capacity compared to markets in the Northeast.

This limited pipeline capacity in the Northeast affected operations at Transco Zone 6 (Z-6) in New Jersey, which serves New York City. Prices at Z-6 peaked at levels over $15.00 per MMBtu and traded between $8.00 to $10.00 for several days during the period. At the Algonquin Pipeline city-gates, which serve the Boston area, prices peaked above $12.00 per MMBtu in the third week of January; but after temperatures had moderated, industry publications reported prices had declined to less than $3.25 per MMBtu by mid-February. At the Henry Hub, spot market prices moved up during this period and traded above $2.90 per MMBtu for several days. The cost for other space-heating fuels also increased dramatically in the Northeast during this time. Home heating oil, which is widely used in much of New York and New England, reached prices above $2.25 per gallon in some Northeast markets or over $16.25 per MMBtu. Propane, which is used as a peaking fuel by local distribution companies and in rural areas for heating, moved up close to $1.40 per gallon at the retail level or about $10.00 per MMBtu.

Storage withdrawals increased 14 percent

Net withdrawals during the 1999-2000 heating season are estimated by EIA to have been 1,954 Bcf or 14 percent more than last year's 1,719 Bcf (Table 9). This is the highest total since the winter of 1995-96, which had a stock drawdown of 2,324 Bcf as a result of HDD's that were almost 4 percent higher than normal. The cold weather in the Midwest and Northeast early in the year saw net withdrawals from storage for January exceed the previous single month record by almost 30 Bcf as 780 Bcf was taken from storage to meet demand. The Consuming East region reported net withdrawals of 527 Bcf or 67 percent of the January total (Table 13). As the cold weather carried over into the first week of February, net withdrawals are estimated nationally to have totaled 454 Bcf or 121 Bcf more than in the same month last year. The relatively high prices that continued throughout most of the heating season probably contributed to the increased utilization of storage during a generally warmer-than-normal winter. EIA estimates that end-of-March stocks were 1,125 Bcf. In order to reach the previous 5-year (1995-99) average of 2,985 Bcf on November 1, 2000, it appears that the industry will need to have a stock build of 1,860 Bcf during the 7-month refill season (April through October).